Speaker: Miklós Z. Rácz (Princeton University)

Title: Finding cliques in random graphs by adaptive probing

Abstract: I will talk about algorithms (with unlimited computational power) which adaptively probe pairs of vertices of a graph to learn the presence or absence of edges and whose goal is to output a large clique. I will focus on the case of the random graph $G(n, 1/2)$, in which case the size of the largest clique is roughly $2\log(n)$. Our main result shows that if the number of pairs queried is linear in n and adaptivity is restricted to finitely many rounds, then the largest clique cannot be found; more precisely, no algorithm can find a clique larger than $c\log(n)$ where $c < 2$ is an explicit constant. I will also discuss this question in the planted clique model. This is based on joint works with Uriel Feige, David Gamarnik, Joe Neeman, Benjamin Schiffer, and Prasad Tetali.